

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application:

**Listing of Claims:**

1. (Currently Amended) A process for carrying out impregnation and/or for preparing a coating which gives release and is leaktight employed at the *engine block/cylinder head interface* of engines and applied to sheet gaskets, comprising:

1 employing a silicone composition

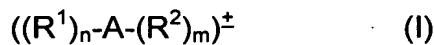
comprising:

A 100 parts by weight of at least one polyorganosiloxane (POS) crosslinkable by the cationic and/or radical route and via crosslinking functional groups (CFGs), these CFGs being identical to or different from one another and being selected from the group consisting of at least one functional unit of heterocyclic nature having one or more electron-donating atoms, at least one ethylenically unsaturated functional unit that is substituted by at least one electron-donating atom which enhances the basicity of the  $\pi$  system, and mixtures thereof;

B from 0.01 to 10 parts by weight of at least one initiator salt (PI) which is a borate of an onium of an element from groups 15 to 17 of the Periodic Classification or of an organometallic complex of an element from groups 4 to 10 of the Periodic Classification, a cationic entity of said borate being selected from the group consisting

of:

(1) onium cations of formula (I):



in which formula:

A represents an element from groups 15 to 17;

R<sup>1</sup> represents a C<sub>6</sub>-C<sub>20</sub> carbocyclic or heterocyclic aryl radical;

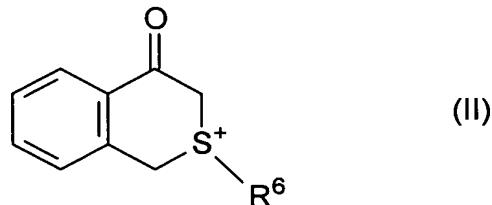
R<sup>2</sup> represents R<sup>1</sup> or a linear or branched C<sub>1</sub>-C<sub>30</sub> alkyl or alkenyl radical;

said R<sup>1</sup> and R<sup>2</sup> radicals optionally being substituted by a C<sub>1</sub>-C<sub>25</sub> alkoxy, C<sub>1</sub>-C<sub>25</sub> alkyl, nitro, chloro, bromo, cyano, carboxy, ester or mercapto group,

n is an integer ranging from 1 to v + 1, v being the valency of the element A,

m is an integer ranging from 0 to v - 1, with n + m = v + 1

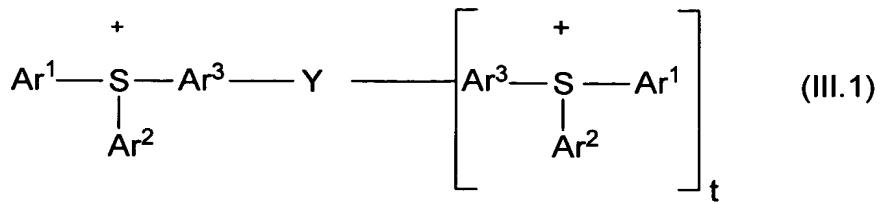
- (2) the oxoisothiocromanium salts cations having the formula:



where the R<sup>6</sup> radical represents a linear or branched C<sub>1</sub>-C<sub>20</sub> alkyl radical;

- (3) sulfonium salts cations where the cationic entity comprises at least one of:

- 3.1. a polysulfonium species of formula III.1



in which:

the  $\text{Ar}^1$  symbols, which can be identical to or different from one another, each represent a monovalent phenyl or naphthyl radical optionally substituted with one or more radicals selected from the group consisting of: a linear or branched  $\text{C}_1\text{-C}_{12}$  alkyl radical, a linear or branched  $\text{C}_1\text{-C}_{12}$  alkoxy radical, a halogen atom, an -OH group, a -COOH group, a -COO-alkyl ester group, where the alkyl part is a linear or branched  $\text{C}_1\text{-C}_{12}$  residue, and a group of formula  $-\text{Y}^4 \text{Ar}^2$ , where the  $\text{Y}^4$  and  $\text{Ar}^2$  symbols have the meanings given immediately below,

the  $\text{Ar}^2$  symbols, which can be identical to or different from one another or  $\text{Ar}^1$  each represent a monovalent phenyl or naphthyl radical optionally substituted with one or more radicals selected from the group consisting of: a linear or branched  $\text{C}_1\text{-C}_{12}$  alkyl radical, a linear or branched  $\text{C}_1\text{-C}_{12}$  alkoxy radical, a halogen atom, an -OH group, a -COOH group and a -COO-alkyl ester group, where the alkyl part is a linear or branched  $\text{C}_1\text{-C}_{12}$  residue,

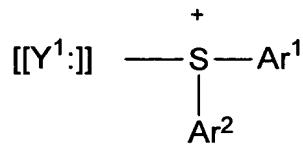
the  $\text{Ar}^3$  symbols, which can be identical to or different from one another, each represent a divalent phenylene or naphthylene radical optionally substituted with one or more radicals chosen from: a linear or branched  $\text{C}_1\text{-C}_{12}$  alkyl radical, a linear or branched  $\text{C}_1\text{-C}_{12}$  alkoxy

radical, a halogen atom, an -OH group, a -COOH group or a -COO-alkyl ester group, where the alkyl part is a linear or branched C<sub>1</sub>-C<sub>12</sub> residue,

t is an integer equal to 0 or 1,

with the proviso that:

when t = 0, the Y symbol is then a Y<sup>1</sup> monovalent radical representing the group of formula Y<sup>1</sup>:

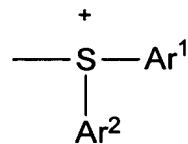


where the Ar<sup>1</sup> and Ar<sup>2</sup> symbols have the meanings given above,

when t = 1:

on the one hand, the Y symbol is then a divalent radical having the following meanings Y<sup>2</sup> to Y<sup>4</sup>:

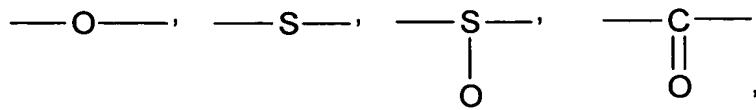
Y<sup>2</sup>: a group of formula:



where the Ar<sup>2</sup> symbol has the meanings given above,

Y<sup>3</sup>: a single valency bond,

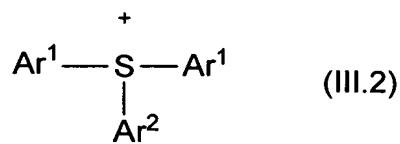
Y<sup>4</sup>: a divalent residue selected from the group consisting of:



a linear or branched C<sub>1</sub>-C<sub>12</sub> alkylene residue and a residue of formula -Si(CH<sub>3</sub>)<sub>2</sub>O-,

on the other hand, solely in the case where the Y symbol represents  $Y^3$  or  $Y^4$ , the  $Ar^1$  and  $Ar^2$  (terminal) radicals have, in addition to the meanings given above, are optionally connected to one another via the  $Y'$ , residue comprising  $Y^1$ , a single valency bond, or in  $Y^2$ , a divalent residue selected from the group of residues recited in the definition of  $Y^4$ , which is inserted between the carbon atoms, facing each other, situated on each aromatic ring in the ortho position with respect to the carbon atom directly bonded to the  $S^+$  cation; and

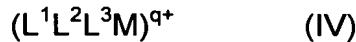
3.2. a monosulfonium species having a single S<sup>+</sup> cationic center per mole of cation and comprising, in the majority of cases, in species of formula:



in which Ar<sup>1</sup> and Ar<sup>2</sup> have the meanings given above with respect to the formula (III.1), including the possibility of connecting directly between them only one of the

Ar<sup>1</sup> radicals to Ar<sup>2</sup> according to the way indicated above with respect to the definition of the additional condition in force when t=l in the formula (II) involving the Y' residue;

(4) organometallic salt cations of formula (IV):



in which formula:

M represents a metal from group 4 to 10,

L<sup>1</sup> represents 1 ligand bonded to the metal M via  $\pi$  electrons, which ligand is selected from the group consisting of  $\eta^3$ -alkyl,  $\eta^5$ -cyclopentadienyl,  $\eta^7$ -cyclo-heptratrienyl ligands and  $\eta^6$  -aromatic compounds selected from the group consisting of optionally substituted  $\eta^6$ -benzene ligands and compounds having from 2 to 4 condensed rings, each ring being capable of contributing to the valency layer of the metal M via 3 to 8  $\pi$  electrons,

L<sup>2</sup> represents a ligand bonded to the metal M via  $\pi$  electrons, which ligand is selected from the group consisting of  $\eta^7$ - cycloheptatrienyl ligands and  $\eta^6$  - aromatic compounds selected from the group consisting of optionally substitute  $\eta^6$ -benzene ligands and compounds having from 2 to 4 condensed rings, each ring being capable of contributing to the valency layer of the metal M via 6 or 7  $\pi$  electrons,

L<sup>3</sup> represents from 0 to 3 identical or different ligands bonded to the metal M via  $\sigma$  electrons, which ligand(s) is (are) CO or NO<sub>2</sub><sup>+</sup>; the total electronic charge q of the complex to which L<sup>1</sup>, L<sup>2</sup> and L<sup>3</sup> and the ionic charge of the metal M contribute being positive and equal to 1 or 2; an *anionic entity* borate having the formula:



in which formula:

a and b are integers ranging from 0 to 3 for a and from 1 to 4 for b, with  
 $a + b = 4$ ,

the X symbols represent:

a halogen atom with a = 0 to 3,

an OH functional group with a = 0 to 2,

the R symbols are identical or different and represent:

a phenyl radical substituted by at least one electron-withdrawing group and/or by at least 2 halogen atoms, this being when the cationic entity is an onium of an element from groups 15 to 17,

a phenyl radical substituted by at least one electron-withdrawing element or group, this being when the cationic entity is an organometallic complex of an element from groups 4 to 10,

an aryl radical comprising at least two aromatic nuclei, which is optionally substituted by at least one electron-withdrawing element or group, whatever the cationic entity;

- C 1 to 50 parts by weight of at least one reactive diluent selected from the group consisting of a nonorganosilicon organic compound, and an organosilicon ~~and an organic compound~~ comprising, in its structure, at least one CFG as defined above and optionally at least one secondary functional group (SFG) other than a CFG but capable of reacting chemically with a CFG;
- D 0 to 10 parts by weight of at least one pigment;

- E 0 to 100 parts by weight of a filler of inorganic nature;
  - F 0 to 10 parts by weight of at least one photosensitizer;
  - G 0 to  $10^{-2}$  part by weight of a stabilizer comprising at least one stabilizing amine agent,
  - H 0 to 5 parts by weight of an adhesion promoter;
- 2 applying this composition to a support ,and
- 3 crosslinking the applied composition by photochemical and/or thermal activation and/or under an electron beam.

2. (Previously Presented) The process as claimed in Claim 1, wherein the support is a metal cylinder head gasket.

3. (Previously Presented) The process as claimed in Claim 2, wherein the support is a metal multilayer cylinder head gasket and a coating is formed on at least one of the faces of at least one of the layers comprising the metal multilayer cylinder head gasket.

4. (Previously Presented) The process as claimed in Claim 1, wherein the functional units included in the CFG groups are selected from the group consisting of the following units:

- an ethylenically unsaturated and activated functional group,
- epoxide,
- oxetane,
- and their mixtures,

and wherein the functional units included in the optional SFG groups are selected from the group consisting of the following units:

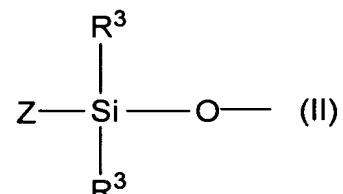
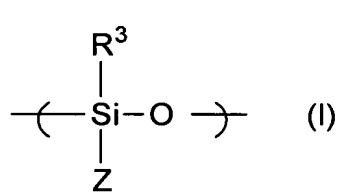
hydroxyl,

alkoxy,

carboxyl,

and their mixtures.

5. (Previously Presented) The process as claimed in Claim 1, wherein the polyorganosiloxane is an epoxysilicone and/or a vinyl ether silicone which is:  
either linear or substantially linear and comprised of units of formula (I),  
terminated by units of formula (II),  
or cyclic and comprised of units of formula (II):



in which formulae:

the  $R^3$  symbols are alike or different and represent:

either a hydroxyl radical,

or a linear or branched C<sub>1</sub>-C<sub>18</sub> alkyl radical which is optionally

substituted by one or more halogens and/or a hydroxyl radical,

or a C<sub>2</sub>-C<sub>8</sub> alkenyl radical,

or an optionally substituted C<sub>5</sub>-C<sub>8</sub> cycloalkyl radical,

or an aryl or aralkyl radical which is optionally substituted by halogens and/or alkoxyls,

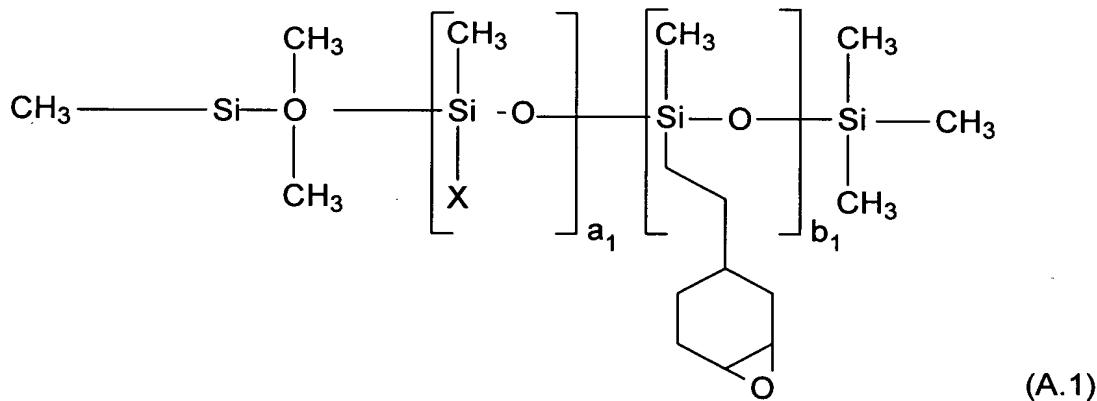
the Z symbols are alike or different and represent:

either the R<sup>3</sup> radical,

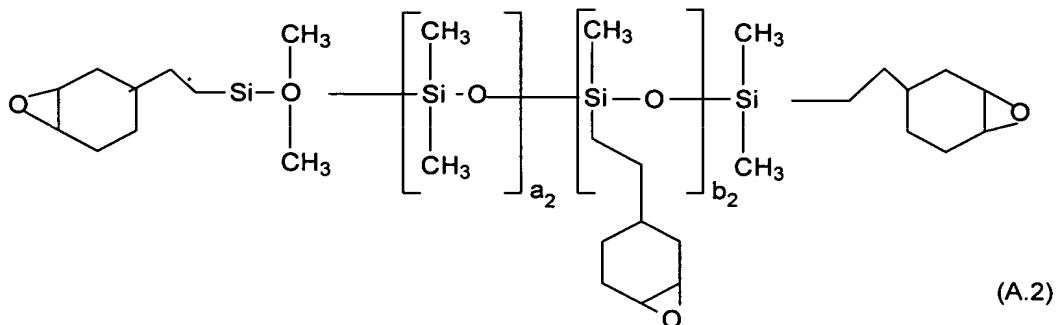
or a CFG group corresponding to an epoxide or vinyl ether residue connected to the silicon via a divalent radical comprising from 2 to 20 carbon atoms and optionally comprising a heteroatom,

at least one of the Z symbols corresponding to a CFG group.

6. (Previously Presented) The process as claimed in Claim 1, wherein the polyorganosiloxane is an epoxysilicone having a formula selected from the group consisting of (A.1), (A.2) and (A.3):



wherein X = CH<sub>3</sub>; phenyl; C<sub>5</sub>-C<sub>8</sub> cycloalkyl; C<sub>1</sub>-C<sub>18</sub> alkyl; C<sub>2</sub>-C<sub>8</sub> alkenyl; -OH; H; -CH<sub>2</sub>-CH<sub>2</sub>-OH; -CH<sub>2</sub>-CH<sub>2</sub>-CF<sub>3</sub> or -(CH<sub>2</sub>)<sub>n</sub>-CF<sub>3</sub>, n = 1 to 20;



(A.2)

$a_1$ ,  $a_2$ ,  $b_1$  and  $b_2$  being defined as follows in these formulae (A.1) and (A.2)

$$1 \leq a_1, a_2 \quad 1 \leq b_1, b_2$$

$a_2$  and  $b_2$  being = 0 in the formula (A. 2) to give the epoxidized disiloxane (A.3).

7. (Currently Amended) The process as claimed in Claim 1 A process for carrying out impregnation and/or for preparing a coating which gives release and is leaktight employed at the engine block/cylinder head interface of engines and applied to sheet gaskets, comprising:

1 employing a silicone composition

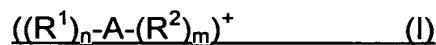
comprising:

A 100 parts by weight of at least one polyorganosiloxane (POS) crosslinkable by the cationic and/or radical route and via crosslinking functional groups (CFGs), these CFGs being identical to or different from one another and being selected from the group consisting of at least one functional unit of heterocyclic nature having one or more electron-donating atoms, at least one ethylenically unsaturated functional unit that is substituted by at least one electron-donating atom which enhances the basicity of the  $\pi$  system, and mixtures thereof;

B from 0.01 to 10 parts by weight of at least one initiator salt (PI) which is  
a borate of an onium of an element from groups 15 to 17 of the  
Periodic Classification or of an organometallic complex of an element  
from groups 4 to 10 of the Periodic Classification,  
a cationic entity of said borate being selected from the group consisting

of:

(1) onium cations of formula (I):



in which formula:

A represents an element from groups 15 to 17;

R<sup>1</sup> represents a C<sub>6</sub>-C<sub>20</sub> carbocyclic or heterocyclic aryl radical;

R<sup>2</sup> represents R<sup>1</sup> or a linear or branched C<sub>1</sub>-C<sub>30</sub> alkyl or alkenyl radical;

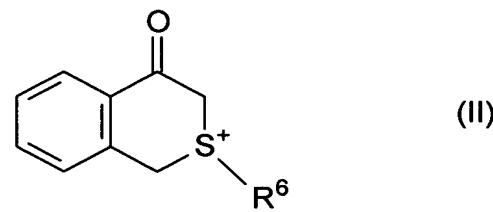
said R<sup>1</sup> and R<sup>2</sup> radicals optionally being substituted by a C<sub>1</sub>-C<sub>25</sub> alkoxy,

C<sub>1</sub>-C<sub>25</sub> alkyl, nitro, chloro, bromo, cyano, carboxy, ester or mercapto  
group.

n is an integer ranging from 1 to v + 1, v being the valency of the  
element A,

m is an integer ranging from 0 to v - 1, with n + m = v + 1

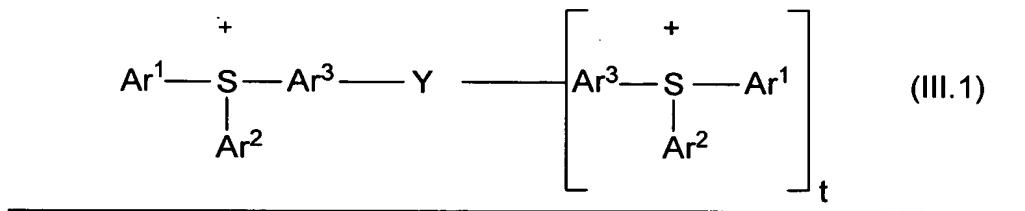
(2) the oxoisothiochromanium cations having the formula:



where the R<sup>6</sup> radical represents a linear or branched C<sub>1</sub>-C<sub>20</sub> alkyl radical;

(3) sulfonium cations where the cationic entity comprises at least one of:

3.1. a polysulfonium species of formula III.1



in which:

the Ar<sup>1</sup> symbols, which can be identical to or different from one another, each represent a monovalent phenyl or naphthyl radical optionally substituted with one or more radicals selected from the group consisting of: a linear or branched C<sub>1</sub>-C<sub>12</sub> alkyl radical, a linear or branched C<sub>1</sub>-C<sub>12</sub> alkoxy radical, a halogen atom, an -OH group, a -COOH group, a -COO-alkyl ester group, where the alkyl part is a linear or branched C<sub>1</sub>-C<sub>12</sub> residue, and a group of formula -Y<sup>4</sup> Ar<sup>2</sup>, where the Y<sup>4</sup> and Ar<sup>2</sup> symbols have the meanings given immediately below,

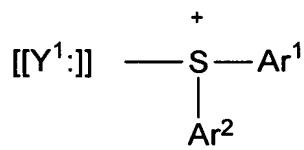
the Ar<sup>2</sup> symbols, which can be identical to or different from one another or Ar<sup>1</sup> each represent a monovalent phenyl or naphthyl radical optionally substituted with one or more radicals selected from the group consisting of: a linear or branched C<sub>1</sub>-C<sub>12</sub> alkyl radical, a linear or branched C<sub>1</sub>-C<sub>12</sub> alkoxy radical, a halogen atom, an -OH group, a -COOH group and a -COO-alkyl ester group, where the alkyl part is a linear or branched C<sub>1</sub>-C<sub>12</sub> residue,

the Ar<sup>3</sup> symbols, which can be identical to or different from one another, each represent a divalent phenylene or naphthylene radical optionally substituted with one or more radicals chosen from: a linear or branched C<sub>1</sub>-C<sub>12</sub> alkyl radical, a linear or branched C<sub>1</sub>-C<sub>12</sub> alkoxy radical, a halogen atom, an -OH group, a -COOH group or a -COO-alkyl ester group, where the alkyl part is a linear or branched C<sub>1</sub>-C<sub>12</sub> residue,

t is an integer equal to 0 or 1,

with the proviso that:

when t = 0, the Y symbol is then a Y<sup>1</sup> monovalent radical representing the group of formula Y<sup>1</sup>:

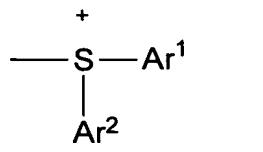


where the Ar<sup>1</sup> and Ar<sup>2</sup> symbols have the meanings given above,

when t = 1:

on the one hand, the Y symbol is then a divalent radical having the following meanings Y<sup>2</sup> to Y<sup>4</sup>:

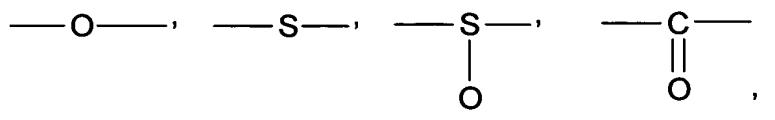
Y<sup>2</sup>: a group of formula:



where the Ar<sup>2</sup> symbol has the meanings given above,

Y<sup>3</sup>: a single valency bond,

Y<sup>4</sup>: a divalent residue selected from the group consisting of:

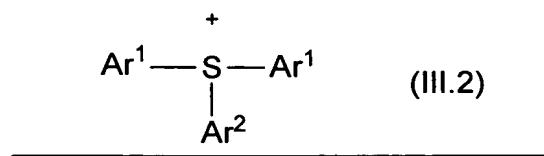


a linear or branched C<sub>1</sub>-C<sub>12</sub> alkylene residue and a residue of formula

-Si(CH<sub>3</sub>)<sub>2</sub>O-,

on the other hand, solely in the case where the Y symbol represents Y<sup>3</sup> or Y<sup>4</sup>, the Ar<sup>1</sup> and Ar<sup>2</sup> (terminal) radicals have, in addition to the meanings given above, are optionally connected to one another via the Y', residue comprising Y'<sup>1</sup>, a single valency bond, or in Y'<sup>2</sup>, a divalent residue selected from the group of residues recited in the definition of Y<sup>4</sup>, which is inserted between the carbon atoms, facing each other, situated on each aromatic ring in the ortho position with respect to the carbon atom directly bonded to the S<sup>+</sup> cation; and

3.2. a monosulfonium species having a single S<sup>+</sup> cationic center per mole of cation and comprising, in the majority of cases, in species of formula:



in which Ar<sup>1</sup> and Ar<sup>2</sup> have the meanings given above with respect to the formula (III.1), including the possibility of connecting directly between them only one of the Ar<sup>1</sup> radicals to Ar<sup>2</sup> according to the way indicated above with respect to the definition of the additional condition in force when t=1 in the formula (II) involving the Y' residue;

(4) organometallic cations of formula (IV):



in which formula:

M represents a metal from group 4 to 10,

L<sup>1</sup> represents 1 ligand bonded to the metal M via π electrons, which ligand is selected from the group consisting of η<sup>3</sup>-alkyl, η<sup>5</sup>-cyclopentadienyl, η<sup>7</sup>-cyclo- heptratrienyl ligands and η<sup>6</sup> -aromatic compounds selected from the group consisting of optionally substituted η<sup>6</sup>-benzene ligands and compounds having from 2 to 4 condensed rings, each ring being capable of contributing to the valency layer of the metal M via 3 to 8 π electrons,

L<sup>2</sup> represents a ligand bonded to the metal M via π electrons, which ligand is selected from the group consisting of η<sup>7</sup>- cycloheptatrienyl ligands and η<sup>6</sup> - aromatic compounds selected from the group consisting of optionally substitute η<sup>6</sup>-benzene ligands and compounds having from 2 to 4 condensed rings, each ring being capable of contributing to the valency layer of the metal M via 6 or 7 π electrons,

L<sup>3</sup> represents from 0 to 3 identical or different ligands bonded to the metal M via σ electrons, which ligand(s) is (are) CO or NO<sub>2</sub><sup>+</sup>; the total

electronic charge q of the complex to which L<sup>1</sup>, L<sup>2</sup> and L<sup>3</sup> and the ionic charge of the metal M contribute being positive and equal to 1 or 2;  
an anionic entity borate having the formula:



in which formula:

a and b are integers ranging from 0 to 3 for a and from 1 to 4 for b, with  
a + b = 4,

the X symbols represent:

a halogen atom with a = 0 to 3,

an OH functional group with a = 0 to 2,

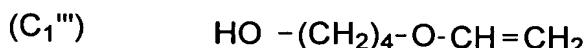
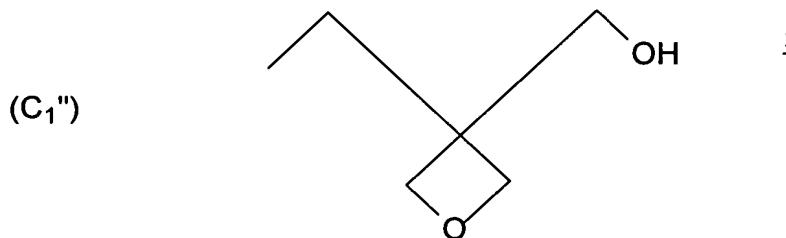
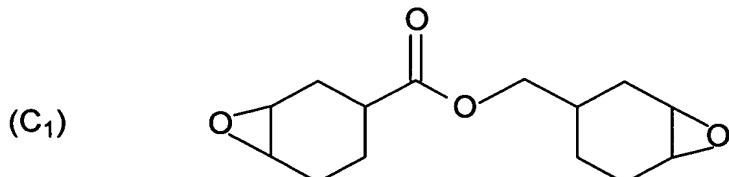
the R symbols are identical or different and represent:

a phenyl radical substituted by at least one electron-withdrawing group  
and/or by at least 2 halogen atoms, this being when the cationic entity  
is an onium of an element from groups 15 to 17,

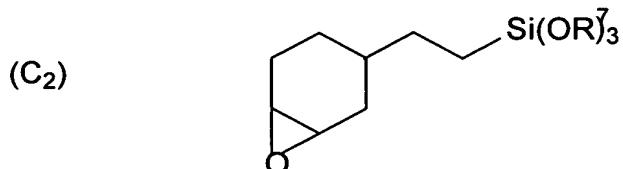
a phenyl radical substituted by at least one electron-withdrawing  
element or group, this being when the cationic entity is an  
organometallic complex of an element from groups 4 to 10,  
an aryl radical comprising at least two aromatic nuclei, which is  
optionally substituted by at least one electron-withdrawing element or  
group, whatever the cationic entity;

C    1 to 50 parts by weight of at least one reactive diluent selected from the  
group consisting of wherein the reactive diluent(s) C is (are) selected from the group  
consisting of:

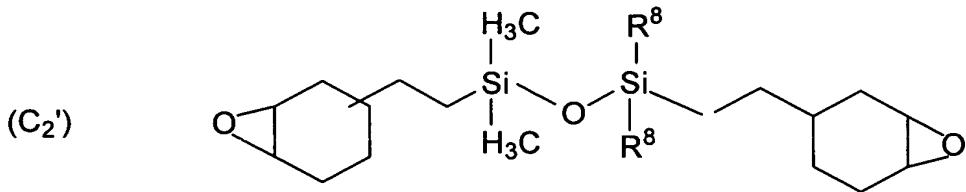
~~the nonorganosilicon organic compounds (C<sub>1</sub>) possessing CFG + optionally SFG reactive groups having the following formulae:~~



~~and the organosilicon compounds (C<sub>2</sub>) possessing CFG + optionally SFG reactive groups having the following formulae:~~



with R<sup>7</sup>= C<sub>1</sub>-C<sub>10</sub> alkyl; and



with R<sup>8</sup> independently representing a C<sub>1</sub>-C<sub>10</sub> alkyl.

8. (Previously Presented) The process as claimed in Claim 1, wherein the diluent (C) exhibits a boiling point B.P.  $\geq 100^{\circ}\text{C}$  at standard atmospheric pressure and a viscosity at 25°C  $\eta \leq 100 \text{ mPa.s.}$

9. (Previously Presented) The process as claimed in Claim 1, wherein, prior to stage 1, the support to be coated is covered using an adhesion primer comprising at least one compound selected from the group consisting of:

alkoxylated silanes carrying at least one ethylenic unsaturation and/or at least one epoxide functional group,  
(meth)acrylates,  
metal chelates and/or alkoxides,  
crosslinkable silicone compositions, and compositions which are precursors of silicone elastomers.

10. (Previously Presented) The process as claimed in Claim 1, wherein the heterocyclic aryl radical in formula (I) comprises nitrogen or sulfur as a heteroelement.

11. (Previously Presented) The process as claimed in Claim 1, wherein  
the support is a cylinder head sheet gasket or a cylinder head/engine block interface.